

## ABSTRACT

A group of inventions relate generally to radio engineering, and more particularly to a method of data transmission (embodiments) and apparatus of data transmission (embodiments) to be used, for example, in cellular  
5 communications systems when transmitting an information signal over the downlink from base station to mobile station.

The goal of the present method of data transmission (embodiments) and the apparatus of data transmission (embodiments) is to increase the efficiency of the information signal transmission in the downlink and, thus, maximize  
10 the information signal reception quality at the mobile station. The claimed solution also reduces the feedback channel (from mobile to base station) load.

The object of the invention is attained by correcting the spectrum of the transmitted information signal copies, transmitting the information signal  
15 copies from each adaptive antenna array in each efficient transmission direction, estimating the transfer functions of the directional transmission channels using the pilot signals transmitted from each antenna element, pilot signals for transmit diversity, transmitted from each adaptive antenna array in each efficient transmission direction, combining these two  
20 estimates, and by estimating the efficient transmission directions at the base station using the mobile station signal.

(Fig. 11)